BRUHATH BANGALORE MAHANAGARA PALIKE

Name of the Agency	:	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	:	Improvements and Asphalting of Santhoshnagara Roads in Ward No. 13 in Shettyhalli Su. Division, BBMP, Bangalore.
Estimate Cost	:	Rs.

QUALITY CONTROL REPORTS TO

Asst. Executive Engineer,
Shettyhalli Sub Division,
BBMP, Bangalore.

CIVIL-TECH CONSULTANTS & ENGINEERS

Building & Highway Material Testing Laboratory

NABL ACCREDITED LABORATOTY AS PER ISO / IEC – 17025:2005

No.23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara,
Basaveshwaranagar, Bangalore – 560 079.

QUALITY CONTROL REPORTS FOR

WET MIX MACADAM(WMM)

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Job No.: CTCE/BBMP/W.No.13/GNR/WMM/Gradation/2015-16

10.02.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Mr. G.N. Ramesh,**
No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.

Name of Work : Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.

Reference : EE/DD/WO/369/2014-15 Datd: 31.03.2015

Date of Testing : 10.02.2016

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): 7820

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	275	275	3.5	96.5	95-100
22.4	2635	2910	37.2	62.8	60-80
11.2	1615	4525	57.9	42.1	40-60
4.75	860	5385	68.9	31.1	25-40
2.36	975	6360	81.3	18.7	15-30
0.600	590	6950	88.9	11.1	8-22
0.075	545	7495	95.8	4.2	0-8

Note:

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Job No.: CTCE/BBMP/W.No.13/GNR/WMM/Gradation/2015-16

10.02.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Mr. G.N. Ramesh,**
No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.

Name of Work : Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.

Reference : EE/DD/WO/369/2014-15 Datd: 31.03.2015

Date of Testing : 10.02.2016

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): 7545

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	215	215	2.8	97.2	95-100
22.4	2625	2840	37.6	62.4	60-80
11.2	1525	4365	57.9	42.1	40-60
4.75	825	5190	68.8	31.2	25-40
2.36	915	6105	80.9	19.1	15-30
0.600	540	6645	88.1	11.9	8-22
0.075	505	7150	94.8	5.2	0-8

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10.02.2016

GRADATION FOR WMM
MORTH TABLE-400-11

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Agency : **Mr. G.N. Ramesh,**
No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.

Name of Work : Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.

Reference : EE/DD/WO/369/2014-15 Datd: 31.03.2015

Date of Testing : 10.02.2016

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **7620**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	165	165	2.2	97.8	95-100
22.4	2615	2780	36.5	63.5	60-80
11.2	1515	4295	56.4	43.6	40-60
4.75	820	5115	67.1	32.9	25-40
2.36	940	6055	79.5	20.5	15-30
0.600	565	6620	86.9	13.1	8-22
0.075	515	7135	93.6	6.4	0-8

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10.02.2016

GRADATION FOR WMM
MORTH TABLE-400-11

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Agency : **Mr. G.N. Ramesh,**
No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.

Name of Work : Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.

Reference : EE/DD/WO/369/2014-15 Datd: 31.03.2015

Date of Testing : 10.02.2016

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): 7390

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	185	185	2.5	97.5	95-100
22.4	2595	2780	37.6	62.4	60-80
11.2	1415	4195	56.8	43.2	40-60
4.75	835	5030	68.1	31.9	25-40
2.36	925	5955	80.6	19.4	15-30
0.600	575	6530	88.4	11.6	8-22
0.075	520	7050	95.4	4.6	0-8

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Job No.: CTCE/BBMP/W.No.13/GNR/WMM/Gradation/2015-16

10.02.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Mr. G.N. Ramesh,**
No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.

Name of Work : Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.

Reference : EE/DD/WO/369/2014-15 Datd: 31.03.2015

Date of Testing : 10.02.2016

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **7515**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	265	265	3.5	96.5	95-100
22.4	2595	2860	38.1	61.9	60-80
11.2	1325	4185	55.7	44.3	40-60
4.75	845	5030	66.9	33.1	25-40
2.36	920	5950	79.2	20.8	15-30
0.600	575	6525	86.8	13.2	8-22
0.075	535	7060	93.9	6.1	0-8

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10.02.2016

GRADATION FOR WMM
MORTH TABLE-400-11

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Agency : **Mr. G.N. Ramesh,**
No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.

Name of Work : Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.

Reference : EE/DD/WO/369/2014-15 Datd: 31.03.2015

Date of Testing : 10.02.2016

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **7730**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	185	185	2.4	97.6	95-100
22.4	2765	2950	38.2	61.8	60-80
11.2	1355	4305	55.7	44.3	40-60
4.75	925	5230	67.7	32.3	25-40
2.36	865	6095	78.8	21.2	15-30
0.600	645	6740	87.2	12.8	8-22
0.075	660	7400	95.7	4.3	0-8

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Job No.: CTCE/BBMP/W.No.13/GNR/WMM/AIV/2015-16

11.02.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	11.02.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	379	383	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	80	84	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	299	
4	Aggregate Impact value = percent fines	21.11	21.93	
	100* (W_2/W_1)%			21.52

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.13/GNR/WMM/AIV/2015-16

11.02.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	11.02.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	385	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	83	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	299	
4	Aggregate Impact value = percent fines	21.73	22.34	
	100* (W_2/W_1)%			22.03

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.13/GNR/WMM/AIV/2015-16

11.02.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	11.02.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	383	387	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	88	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	299	
4	Aggregate Impact value = percent fines	21.93	22.74	
	100* (W_2/W_1)%			22.34

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.13/GNR/WMM/S-T/2015-16 11.02.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of Work	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	11.02.2016

Result : Flakiness Index = **12.35%**

Elongation Index = **13.18%**

Result : Combined Flakiness & Elongation index **25.53%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No.13/GNR/WMM/S-T/2015-16 11.02.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of Work	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	11.02.2016

Result : Flakiness Index = **11.56%**

Elongation Index = **13.27%**

Result : Combined Flakiness & Elongation index 24.83%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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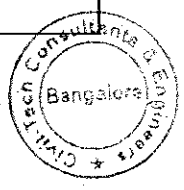
Job No.: CTCE/BBMP/W.No.13/GNR/WMM/S-T/2015-16 11.02.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of Work	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	11.02.2016



Result : Flakiness Index = **11.34%**

Elongation Index = **13.72%**

Result : Combined Flakiness & Elongation index **25.06%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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QUALITY CONTROL REPORTS FOR

BITUMINOUS CONCRETE

CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

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T-2377

Job No.: CTCE/BBMP/W.No.13/GNR/CSR-03/1096a/Bitumen/2015-16 16.03.2016

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

* CUSTOMER	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
* AGENCY	:	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
* NAME OF WORK	:	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	:	EE/DD/WO/369/2014-15 Datd: 31.03.2015
SAMPLE ID	:	Bitumen – Sample 1
SAMPLE RECEIVED ON	:	14.03.2016
DATEOF TESTING	:	14.03.2016 to 16.03.2016

The results of the tests conducted on the Bitumen sample are as follows:

Sl.No	Description	Test Result	Technical Reference	Requirement as per IS: 73-2013)
1	Penetration at 25^{0}C, 100g, 5 Sec 1/10 mm	69	IS: 1203-1978 (RA-2009)	60 to 70
2	Softening point, ^{0}C	50	IS: 1205-1978 (RA-2009)	Min. 45
3	Ductility at 27^{0}C, cm	>100	IS: 1208-1978 (RA-2009)	Min. 50
4	Flash Point, ^{0}C	274	IS: 1209-1978 (RA-2009)	Min. 220

*Information is furnished by the Customer/Representative.

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VISHWANATH .C
Quality Manager

****

#23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.
Tele Fax : 23223227, Website : www.civiltechconsultants.com
E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

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Job No.: CTCE/BBMP/W.No.13/GNR/BC/AIV/2015-16

16.03.2016

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	16.03.2016

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	378	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	82	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines			
	100* (W_2/W_1) percent	20.63	21.47	**21.05**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

Note:

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Job No.: CTCE/BBMP/W.No.13/GNR/BC/AIV/2015-16 16.03.2016

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	16.03.2016

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	384	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	84	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	21.47	21.88	21.67

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CTCE/BBMP/W.No.13/GNR/BC/AIV/2015-16

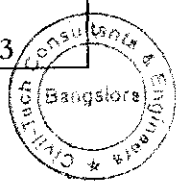
16.03.2016

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	16.03.2016

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	376	379	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	76	79	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	20.21	20.84	20.53



Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CTCE/BBMP/W.No.13/GNR/BC/AIV/2015-16

16.03.2016

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	16.03.2016

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	377	380	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	77	80	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	20.42	21.05	20.74

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: .: CTCE/BBMP/W.No.13/GNR/BC/Shape.T/2015-16 : 16.03.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of Work	; Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: EE/DD/WO/369/2014-15 Datd: 31.03.2015
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Bituminous Concrete
Date of Testing	: 16.03.2016

Result : Flakiness Index = **12.11%**

Elongation Index = **13.25%**

Result : Combined Flakiness & Elongation index **25.36%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

Note:

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DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
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Name of Work	: Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: EE/DD/WO/369/2014-15 Datd: 31.03.2015
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Bituminous Concrete
Date of Testing	: 16.03.2016

Result : Flakiness Index = **11.26%**

Elongation Index = **13.85%**

Result : Combined Flakiness & Elongation index **25.11%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

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DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama,.7th Cross, Maruthi Layout, Bangalore - 560021.
Name of Work	: Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: EE/DD/WO/369/2014-15 Datd: 31.03.2015
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Bituminous Concrete
Date of Testing	: 16.03.2016

Result : Flakiness Index = **11.42%**

Elongation Index = **13.84%**

Result : Combined Flakiness & Elongation index 25.26%

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

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Job No.: .: CTCE/BBMP/W.No.13/GNR/BC/Shape.T/2015-16 : 16.03.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of Work	: Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: EE/DD/WO/369/2014-15 Datd: 31.03.2015
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Bituminous Concrete
Date of Testing	: 16.03.2016

Result : Flakiness Index = **11.46%**

Elongation Index = **13.87%**

Result : Combined Flakiness & Elongation index **25.33%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.13/GNR/BC/Stripping/2015-16

18.03.2016

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Type of Mix	Bituminous Concrete
Date of Testing	18.03.2016

Type of binder : 60/70

Percentage of binder used : 5.00% by wt.

Total weight of aggregate : 200 g

Total weight of binder : 10.00 g

Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	2.8	2.80	97.20
2	2.7		
3	2.9		

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.13/GNR/BC/Sp_Wa/2015-16

18.03.2016

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Type of Mix	Bituminous Concrete
Date of Testing	18.03.2016

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2024	1994	1996	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1269	1239	1241	
4	Weight of saturated surface dry aggregate in air	W_3 g	2031	2014	2016	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	762	775	775	
6	Weight of oven dried aggregate	W_4 g	2014	1997	1998	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.643	2.577	2.578	2.599
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.703	2.635	2.639	2.659
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.84%	0.85%	0.90%	0.87%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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JobNo: CTCE/BBMP/W.No.13/GNR/BC/Bitumen/2015-16 18.03.2016

BITUMEN CONTENT DETERMINATION OF BITUMINOUS CONCRETE MIX

AASHTO T 164

CLIENT	Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	Mr. G.N. Ramesh, No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
NAME OF THE WORK	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	EE/DD/WO/369/2014-15 Datd: 31.03.2015
SAMPLE I/D	Roads in SAnthoshnagara, Ward No. 13
DATE OF TESTING	18.03.2016

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BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	473.5	473
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	26.5	27.00
7. Bitumen content in %	5.30	5.40
8. Average	5.35	

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JobNo: CTCE/BBMP/W.No.13/GNR/BC/Gradation/2015-16 18.03.2016

BITUMEN GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

AASHTO T 30

CLIENT	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
NAME OF THE WORK	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	EE/DD/WO/369/2014-15 Datd: 31.03.2015
SAMPLE I/D	Roads in SAnthoshnagara, Ward No. 13
DATE OF TESTING	18.03.2016

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GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	42.16	8.90	8.90	91.10	79-100
9.5	36.25	7.66	16.56	83.44	70-88
4.75	73.18	15.46	32.01	67.99	53-71
2.36	66.32	14.01	46.02	53.98	42-58
1.18	51.48	10.87	56.89	43.11	34-48
0.6	63.47	13.40	70.30	29.70	26-38
0.3	46.85	9.89	80.19	19.81	18-28
0.15	32.21	6.80	86.99	13.01	12-20
0.075	35.29	7.45	94.45	5.55	4-10

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	35.26	7.45	7.45	92.55	79-100
9.5	45.87	9.70	17.15	82.85	70-88
4.75	72.15	15.25	32.41	67.59	53-71
2.36	62.35	13.18	45.59	54.41	42-58
1.18	74.15	15.68	61.26	38.74	34-48
0.6	43.26	9.15	70.41	29.59	26-38
0.3	35.98	7.61	78.02	21.98	18-28
0.15	42.12	8.90	86.92	13.08	12-20
0.075	32.13	6.79	93.71	6.29	4-10

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Job No.: CTCE/BBMP/W.No.13/GNR/BC/Agg/2015-16 18.03.2016

Aggregate Gradation Test

IS : 2386 Part I

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	18.03.2016

Total Weight of Sample: **5450** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade II specification as per MORTH
13.2	542	9.94	9.94	90.06	79 - 100	
9.5	556	10.20	20.15	79.85	70 - 88	
4.75	724	13.28	33.43	66.57	53 - 71	
2.36	635	11.65	45.08	54.92	42 - 58	
1.18	615	11.28	56.37	43.63	34 - 48	
0.600	690	12.66	69.03	30.97	26 - 38	
0.300	613	11.25	80.28	19.72	18 - 28	
0.150	289	5.30	85.58	14.42	12 - 20	
0.075	415	7.61	93.19	6.81	4 - 10	

Total Weight of Sample: **4800** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade II specification as per MORTH
13.2	625	13.02	13.02	86.98	79 - 100	
9.5	469	9.77	22.79	77.21	70 - 88	
4.75	637	13.27	36.06	63.94	53 - 71	
2.36	505	10.52	46.58	53.42	42 - 58	
1.18	645	13.44	60.02	39.98	34 - 48	
0.600	516	10.75	70.77	29.23	26 - 38	
0.300	395	8.23	79.00	21.00	18 - 28	
0.150	406	8.46	87.46	12.54	12 - 20	
0.075	315	6.56	94.02	5.98	4 - 10	

Note:

⇒ This test report should not be reproduced except in full, without written approval of the laboratory

⇒ The results indicated above are based on the tests carried out on the samples received in the laboratory

⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

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CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/W.No.13/GNR/BC/Stability/2015-16 18.03.2016

TEST REPORT ON STABILITY OF MIX

Client	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	:	**Mr. G.N. Ramesh,** No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	:	Improvements and Asphalting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference		EE/DD/WO/369/2014-15 Dated: 31.03.2015
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	18.03.2016

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	10.70	10.25	9 Kn (min)
2	Marshal flow, mm	3.15	2.20	2 – 4
3	Percent air voids in Mineral Aggregate	13.50	14.15	13 – 15
4	Voids in Compacted Mix	5.25	4.30	3 – 6
5	Percent Voids filled with Bitumen	69.80	70.25	65 - 75
6	Density, g/cc	2.26	2.27	--

Note:

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